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ON THE MANNER OF FEEDING IN *TESTACELLA SCUTULUM.*

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Plate I.

The members of the genus *Testacella* rank among the most highly specialized forms that come under the heading of pulmonate gastropoda, and the two most interesting and at the same time most important conditions of life to which their specialization adapts these slugs, are an underground habitat, and a dietary of earthworms.

A body tapering from behind forwards assists the passage of the creature through the soil, and a very small shell protects the heart, kidneys, and breathing-chamber, which are situated at the extreme end posteriorly, while the fact that the main part of the animal lies in front of the shell, being the morphological equivalent of the anterior and retractile portion in *Limax* and *Helix*, gives considerable play to the greatly developed muscles of the alimentary system which are concerned in seizing and swallowing a living prey.

Most authors dismiss *Testacella* with the mere mention of its carnivorous propensities and nocturnal habits, while others give more or less discursive and varying accounts of the way in which it feeds. The object of this paper is to record the results of some experiments recently made by the present writer, which though not tending to confirm some of the poetical statements included in the following quotations will carry others into greater detail.

Sixty years before Cuvier constituted the genus *Testacella*, du Gué* called attention to one of the species afterwards included in it, and to the fact that it lived on earthworms, stating with regard to a specimen that he had:—"It has been kept in a pot with some earthworms three or four inches long and as thick as a pen; it feeds on them, though much less strong in appearance. It occupied four or five hours in swallowing one entirely, but did not risk losing its prey during this long time. When once it has seized it by one end it cannot afterwards escape, no matter what efforts it may make." He adds that the species only goes out at night.

The Vicomte de Querhoent† wrote a letter describing a slug which his gardener found one night after it had half-swallowed a large worm. The slug was partly imbedded in the earth, and the worm was pulled out with it.

The action of *Testacella* is likened by Faure-Biguet‡ to that of a serpent swallowing whole an animal larger than itself, though this peculiar point is noticeable—namely, that the slug only continues to swallow the worm as the part already taken in is digested, the portion which remains outside continuing to show signs of life as long as it is to be seen.

When describing *Testacella scutulum* for the first time, G. B. Sowerby§ expresses his surprise that "an animal so extremely sluggish in its movements, after discovering its prey by means of its tentacles, by thrusting from its large mouth its white crenellated revolute tongue, should instantly seize upon and retain an earthworm of much greater size and apparent force than itself, which by its utmost exertions is unable to escape."

In 1840 an addition was made to the facts already set down,

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* "Lettre à Réaumur sur la *Testacelle*," Hist. Acad. Sci. Paris Obs. Phys. Gen. art. I. p. 1 (1740).

† Quoted by Valmont-Bomare, Dict. d'Hist. Nat., 4e ed. tom. 4, p. 579 (1791). This reference not checked.

‡ "Sur une nouvelle espèce de *Testacelle*," Bull. Sci. Soc. Philomat, Paris, vol. iii. (an. x., 1802), p. 98.

§ 'Genera of Recent and Fossil Shells,' letterpress to Plate 159 (1820—25).

Cantraine* also pointed out that the lingual mass can be protruded, adding that it is covered with rows of long and recurved teeth like a carding-comb.

George Johnson,† in his 'Conchology,' a work that is somewhat overlooked, describes the buccal apparatus as a proboscis, the hold of which on the worm is assisted by bristles which are set upon it. He quotes Sowerby, and is but little in advance of the latter and Cantraine.

Moquin-Tandon,‡ in mentioning the subject gives a reference to du Gué's observations, and alludes also to Querhoent.

In their monograph on the genus, Gassies and Fischer§ give valuable references to the literature of the subject, and a long account moreover of the habits of *Testacella.* They state that the *Testacella* moves slowly to the side of the worm, with "so complete an indifference that one might suppose it had not observed and disdained it;" but, they continue, "while the worm is turning to the left and to the right the former draws in its head, retracts its tentacles, suddenly turns, enormously dilating its mouth, and throws itself on its prey, partly swallowing it by suction." The anterior end is expressly mentioned as the one by which the worm is caught, though sometimes, according to these authors, the middle may be the part seized. A figure is given of *Testacella maugei* in contact with this part of a worm. No very definite idea of a protrusile organ is given, while the animal, which has hitherto been considered sluggish, throws itself upon its prey and enfixes it by a kind of suction, yet nevertheless the palate spines are more exactly described as having barbs.

The well-known English conchologist, the late Dr. Gwyn Jeffreys,|| has devoted more space than most writers to discussing the habits of *Testacella.* He combines most of the previous accounts, adding a few artistic touches of his own, which do not tend to make matters clearer. He says:—"It is scarcely inferior

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[*] Malacol. Méditer. (1840), p. 97.

[†] 'Introduction to Conchology' (1850), p. 313.

[‡] 'Histoire naturelle de Mollusques terrestres et fluviatiles de France' (1855), vol. ii. p. 38.

[§] "Monographie du genre *Testacelle,*" Actes Linn. Soc. Bordeaux, xxi. p. 218, pl. 2.

[||] 'British Conchology' (1862), vol. i. p. 142.

to the tiger, snake, or shark in its cunning and ferocity. Its prey chiefly consists of earth-worms which it hunts underground, and pursues through their galleries, crouching occasionally and making a spring on its victim. It is said that when the poor worm has had the start of its pursuer the snail-slug intercepts it by tunnelling across the line of its retreat. It will devour a lob-worm much larger than itself, seizing it in the middle, and when the writhings have been succeeded by exhaustion, it detaches and swallows one-half of the worm, and after that has been digested it finishes its long meal with the other portion. For this purpose the mouth is furnished with sharp recurved teeth, which enable the *Testacella* to retain a firm hold of its victim and swallow it more easily. The worm is provided with some means of defence in the rows of stiff bristles which encircle its rings, and by contracting its body a short respite is gained. But the chance of ultimate escape or safety is very slight. When the *Testacella* sees or scents its prey, it glides softly and cautiously towards it, and apparently without taking any notice of the worm, it seems to feel its way, and usually succeeds in fastening itself on an unprotected part of the body between the ring. The attack if unsuccessful at first is renewed, but if the worm resists too long the *Testacella* gets impatient, and by pressing or doubling its victim into the earth, by means of which the rings are forced open, its purpose is effected and the meal secured." The idea that the slug detaches half the worm does not seem to be supported by facts. Fèrussac* certainly does say, apparently following Faure-Biguet, that half the worm is inside, half out, but does not intend to give the impression that the halves are separate. The meaning of the last statement in Jeffreys' account, if taken by itself, would be a difficult matter to determine, for if the attack, as stated, were unsuccessful, by what means could the *Testacella* hold a startled worm while pressing it into the earth? But, if we refer again to Gassies and Fischer, where they describe the *Testacella*, the following passage will be found:—"Si elles ne réussissent pas du premier coup, elles font glisser peu à peu le corps de l'animal jusqu'à ce qu'elles soient arrivées à leur but, mais si le ver resiste trop, elles plongent la tête dans la terre, et le ployant en deux parties suivant chaque côté de leurs corps elles le dévorent en sureté."

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* 'Histoire Naturelle des Mollusques' (1811—32), vol. ii. p. 92.

Lovell Reeve* quotes du Gué and Gassies, but the passage from the latter is abridged.

A short description, but one to the point, is given by Paul Fischer†:—"They pursue *Lumbrici* by excavating subterranean galleries, and in order to seize them they dilate their buccal orifice, and protrude the lingual bulb covered with teeth in the form of fish-hooks."

Tryon, in his 'Manual of Conchology,'‡ quotes Jeffreys' account in full.

The following is given by H. de Lacaze-Duthiers§:—"The proceedings of *Testacella* are the results of its habits—in fact, it feeds entirely on earthworms; the latter are extremely lively, and retreat into their burrows with great agility at the slightest alarm; in the evening, when they only come out a few centimetres, the *Testacella* must seize them by no less rapidly darting at them with its tongue. If it wishes to spear its prey, it must pursue it, and therefore elongate itself in order to be able to penetrate into the worm's hole. The worm, sometimes held merely by a few of the hooks on its enemy's tongue, draws back, clinging by the aid of its setæ to the walls of its home, and drags its voracious pursuer with it; it is then a necessity for the *Testacella* to extend itself and follow its victim in order to seize it more completely."

The idea of pursuit is still kept up, and the reasons why the slug elongates itself are a trifle involved and incomplete, while no more detailed description of the action is given than in the case of previous writers.

Three species of *Testacella* have been found in the British Isles—to wit, *T. haliotoidea*, Drap., *T. maugei*, Ferus., and *T. scutulum*, Sowerby, though the claims of the third to be considered a distinct species are not yet fully recognised. This question will be dealt with further on, insomuch as this is the species with which my experiments were made.

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* 'British Land and Freshwater Mollusks' (1863), pp. 28, 31.

† 'Manuel de Conchyliologie' (1883), p. 450.

‡ Vol. iii. p. 11 (1884).

§ "Histoire de la *Testacelle*," Archives Zoologie Expérimentale, series 2, vol. v. (1887), p. 466.

Several fine specimens were found by Mr. H. C. Snell in an old asparagus bed at Buckhurst Hill, and exhibited at a meeting of the Essex Field Club* by the Secretary, Mr. William Cole, who very kindly forwarded them to the present writer. One of these slugs was laid on the damp surface of an old inverted flower-pot saucer, and after a short time the animal extended itself more or less completely (Plate I., figs. 1 and 2). An earthworm was so placed that in the course of its progress it came into contact with the anterior end of the slug. The result of the stimulus was to make the *Testacella* draw in its tentacles and head, and assume somewhat the position shown in fig. 3, where a broad and more or less vertical front is exposed. Other stimuli, as might well be imagined, such as the application of a finger or paint-brush, may have the same effect. If when such a stage has been reached the stimulus be gently continued, as it would be by allowing the worm to crawl up the slug's front, in the centre of which a slight depression above the orifice of the mouth seems to allow of an easier ascent, the tongue-like cartilage which carries the radula may be suddenly, and in the first instance unexpectedly, shot out, the mouth opening to allow of its protrusion (fig. 3).

While the writer was cleaning a specimen of *T. maugei*, which was kindly sent to him, among others, by Mr. F. W. Moore, of the Royal Botanic Gardens, Glasnevin, a drop of cold water fell from the tap on to the front of the slug, which immediately protruded its radula. The apparatus, which is milky white, appears somewhat spoon-shaped looking at it from above (fig. 3 *a*), but broader at the free extremity where there is a slight depression, and as it comes to its limit of extension, the edges, as it were, of the spoon bend upwards and inwards, making the hollow deeper and at the same time narrower.

The radula, or lingual ribbon, which follows the general form of the strong basal cartilage, curling over its edges in front and at the sides, is studded with a great number of chitinous "teeth" arranged in rows; these are placed in such a position that in the hollow of the cartilage the barbed shafts (figs. 6 *a*, 6 *b*), of which they mainly consist, all point towards the mouth of the animal, while where the rows follow the ribbon over the outer sides of the cartilage, they are larger (fig. 6) and directed upwards.

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* 'Essex Naturalist,' vol. vii. (1893), p. 46.

The movements described above have the following effect on the teeth:—The protrusion of the basal cartilage tightens the radula, especially as it passes over the edges of its support, and as these approximate, the teeth on the outside stand more erect, and those on the edge bend inwards and overhang their companions in the hollow, with their barbs pointing to those of the other side (fig. 3 *a*). Thus an action is effected resembling that of the steel jaws of a spring-trap.

If the body of an earthworm be within reach of any of the barbs, it is pierced and held, but when the two series along the edges of the radula grip it, the body of the worm gets forced into the hollow, and caught on the more hidden points. In some instances where the worm was seized by the middle it forced itself away, but when, as was usually the case, the radula closed on its anterior end, its fate was sealed (figs. 4 and 4 *a*). The radula and its cartilage are next withdrawn into the body, as far as its contracted state will allow, and the *Testacella* very gradually extends itself, giving more room inside, and crawling on to its prey literally envelops it. The worm, if small compared with the slug, disappears in a comparatively short space of time.

There does not seem to be any reason for supposing that *Testacella* only feeds at night, although, as earthworms seldom come above ground before daylight disappears, the slugs usually remain underground until that time. The experiments referred to above were all made in the daytime, and one morning many years ago, the writer saw a large yellow specimen, in a garden at Hampstead Heath, which had managed to secure a fine lobworm.

Putting on one side such manifest elaborations as the crouching and springing described by Jeffreys, it seems very questionable whether *Testacella* stalks its prey, or even takes any direct notice of it at all until contact takes place. It is probable that its so-called agility consists merely of the strikingly rapid, but more or less automatic, protrusion of the radula, and that its indifference with regard to the worm's proximity that has been insisted upon, is a matter of necessity, and not invention.

It has already been remarked that some worms escaped when caught by the middle, while those seized so near to the anterior end that this was dragged in front of the mouth were ultimately swallowed. The first observer quoted expressly mentions the end of the annelid, and the Hampstead specimen had its victim fast by the first few segments. Gassies and Fischer figure an example of *T. maugei* with its contracted end in contact with the middle of a worm, but there is no evidence that the latter is being held by anything, and it cannot well be imagined how a really large worm could be swallowed if seized in the centre, as two thicknesses of it would have to be drawn in at once.

Another point there is which is dependent on the comparative size of the worm—namely, whether it can all be swallowed at once—and indeed if a worm were caught that could not be accommodated within the slug, part of it might well be digested before the rest, which would remain connected with it, but outside the devourer.

It will be seen that *Testacella* is particularly well adapted for catching its prey should it meet them in the mouth or other portion of their tunnels. The slug on coming in contact with the head of an advancing earthworm, appearing above ground or what not, would contract, and shrinking back would entirely block the way with its now swollen body. The worm in endeavouring to proceed with more certainty than in the experiments, would continue to irritate the surface of the slug, seeking the groove above the slug's mouth — in some cases small worms actually managed to force their prostomia into the oral aperture — and would be caught in the grip of the radula as it was shot out and held securely, the slug maintaining by its broadened body a firm hold on the walls of the burrow. This method of procedure would not, of course, prevent the *Testacella* from attempting to secure worms in the open, its stealthy movements not alarming the latter in any way, but it would not be so certain of a meal, as the chances of a successful hit with the radula are by no means so great.

As already pointed out, Sowerby described *Testacella scutulum* as a distinct species, but it has been generally considered to be merely a variety of *T. haliotoidea*, and perhaps some good reasons for now treating it as a species ought to be forthcoming.

Mr. J. W. Taylor,* in 1888, states that Mr. Charles Ashford's researches on the anatomy in 1885 leave no doubt that *T. scutulum* is distinct from *T. haliotoidea*, but that it approaches

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* "On the Specific Distinctness and Geographical Distribution of *Testacella scutulum*," Journ. Conchol. 1888, p. 337.

T. maugei more closely in certain points. Mr. Ashford states that he did not publish his results, which were communicated to Mr. Taylor by letter, and that the differences which he pointed out in 1885 he has since found to be constant. Mr. Taylor points out the external differences between the two forms, including the characters of the shells, and goes on to the internal anatomy, finding the greatest difference, as malocologists seem to do, in the reproductive organs, *T. scutulum*, like *T. maugei*, lacking the characteristic flagellum of *T. haliotoidea*. There is one weak point, however, in what is otherwise a convincing paper, and that is, that the organs of the first species are drawn from an example which is stated to be sexually immature. The present writer has been familiar with many of the external differences for some years, and has dissected a number of mature specimens of *T. scutulum* in which no more flagellum was to be made out than appears in Mr. Taylor's figure. There is also considerable difference in the shape of the radula and the teeth.

Thanks are due to Mr. Taylor for a copy of his paper, to Mr. Charles Ashford for his information, and to Mr. B. B. Woodward and Mr. Edgar Smith for assistance in looking up references in books under their charge at the Natural History Museum.

EXPLANATION OF PLATE.

Testacella scutulum, *Sowerby*—Buckhurst Hill, Essex.

Fig. 1. The animal extended, seen from above.
„ 2. The same, but seen from right side.
„ 3. The animal contracted, with radula protruded.
„ 3*a*. View of radula from above, enlarged.
„ 4. The same as fig. 3, but the radula with an earthworm in its grip.
„ 4*a*. Enlarged side view of radula, as seen in fig. 4.
„ 5. The animal enveloping the earthworm by gradual extension.
„ 6. Tooth from side of radula.
„ 6*a*. The same, from a point nearer the centre of the radula.
„ 6*b*. The same, from very near the centre of the radula.

THE CENTENARY OF GILBERT WHITE.

A PILGRIMAGE to the birthplace and home of a celebrated naturalist (if the memory of the man is to be respected) deserves to be undertaken in a spirit of calm contemplation and reverence of Nature, such as pervades every page of his own writing.

To invade his native village with a cavalcade of noisy, dust-stirring vehicles, laden with a few hundred excursionists, and to permit a posse of itinerant fair-goers to take possession of a centrally-situated meadow for the purpose of erecting swings and merry-go-rounds, with their hideous accompaniment of trumpet and steam whistle, seems nothing less than desecration. Yet this was what happened on June 24th, when the members of the Selborne Society, in conjunction with those of the Hampshire Field Naturalists' Club, met at Selborne to celebrate the centenary anniversary of the death of Gilbert White. By whose authority, or for what reason, the owners of trumpet and whistle were allowed to make themselves so objectionable, did not transpire; but, in the opinion of all right-minded members of the societies represented, they should have been sternly repressed. Their presence simply marred the enjoyment of what would otherwise have been a very delightful day.

To some extent we found compensation in the courtesy of Mr. and Mrs. Read, the present occupants of Gilbert White's old house, The Wakes, who kindly permitted visitors to inspect the premises and grounds. The latter are little changed since the date of our first visit some thirty years ago, save that the trees have grown and spread laterally to such an extent as to considerably reduce the charming view of Selborne Hanger which was once obtainable from the lawn. The house itself, alas! has undergone considerable alteration in the way of additions, which were made by a new purchaser on the death of the late Professor Bell. This well-known naturalist, it may be remembered, occupied the house for very many years; first as tenant, and subsequently as owner, and it was his pride to boast of his conservatorship as tolerating no change of any kind in either house or grounds, which he desired to see as much as possible in the condition in which White left them.

At the luncheon (that inevitable concomitant of all similar functions), which was served in a large tent on the outskirts of the village, Lord Selborne presided, and made a speech appropriate to the occasion. He said:—

"Whatever might be thought of any other manner of commemorating the centenary anniversary of the death of Gilbert White, no more fitting or proper mode of marking a sense of his contribution to the science and literature of the country could be devised than their meeting. White's work had qualities which were not always met with in scientific or literary works. He would speak first of the character of the man, and then of the character of his book. Until lately there were no means of knowing anything about the character of Gilbert White except through his book, though a good deal might be collected from that source. When the late Professor Bell was engaged in collecting materials for his excellent edition of the 'Selborne,' he had the advantage of having placed in his hands a very large number of letters which were not included in the book, and among them about eighty-six family letters, which enabled them to see Gilbert White in a somewhat different aspect from that in which he presented himself in his book. Until those materials were found, the impression which most people had formed from the book alone—correct, generally, as far as it went, though perhaps not universally so—was this: first, that Gilbert White was a man of excellent natural abilities, strongly cultivated, and of wide classical attainments and accomplishments, conversant with the best Greek and Latin literature, and with the English also. In some of his letters he more than once referred to Chaucer and to the 'Vision of Piers the Plowman,' with which Englishmen even of the present day were not always acquainted. White was not only an observer of nature, but one who had prepared himself for observation by the best mental cultivation. He was thoroughly acquainted with all the literature of Natural History—his favourite pursuit—which existed in his time. No one could read his book without noticing his remarkable faculty of observation, the constant aim at truth, exactness, and accuracy, and a good deal of humour every now and then; nor could anyone help being struck both with the modesty and simplicity of his character. His modesty prevented him from bringing himself forward or drawing any picture of himself which would be adequate to give a perfect view of his nature. His simplicity contributed a very great charm to the book. White was curate of Selborne for many years, but vicar he never was, as he was not anxious for church preferment. The late James Russell Lowell, one of the most eminent literary men of his country, said in the beginning of his book, 'My Study Window,' that White had had a great deal of influence upon his love for observation of nature, and added: 'One of the most delightful books in my father's library was White's 'Natural History of Selborne.' For me it has rather gained in charm with years. I used to read it without knowing the great pleasure I found in it; but as I grow older I begin to detect some of the simple expedients of this natural magic. Open the book where you will, it takes you out of doors. In simplicity of taste and natural refinement it reminds one of Walton, and in tenderness of Cowper. . . . . The book has also the delightfulness of absolute leisure. Mr. White seems never to have had any harder work to do than to study the habits of his feathered fellow-creatures. His volume is a journal of Adam in Paradise. The same combination of simplicity and refinement, the same humility and absence of ostentation and self-consciousness, which constituted the great charm of White's book, were equally conspicuous in his family correspondence, and the every-day habits of his life. It was clear from the correspondence that White was a most attached relation and affectionate friend, always ready to do everything in his power for all that had claims upon him. There had recently been some controversy as to the best memorial that could be devised for Gilbert White. He agreed with those who thought that the best memorial of the man was to be found in his work, and that nothing more was needed to remind the world of him. In compliance with the prevailing fashion, which was carried too far, it had been suggested that the centenary celebration should be the occasion of raising some memorial; but surely Gilbert White might have written with Horace, 'Exegi monumentum ære perennius.' His book would be his memorial to the end of time. Some statue or bust of White had been proposed, but he was a man who had never sat for his picture, of whose lineaments the present generation had no knowledge, and of whose figure it could only be asserted that it was a little below the ordinary height. As an alternative, it had been proposed that the memorial should take the form of something useful for the people of the village. That would not have the character of a personal memorial, and might soon cease to be associated with the present celebration; but, at any rate, that would be better, and Gilbert White himself would certainly have said so. Although on some points people at the present day might not agree with White, the difference did not interfere with the enjoyment of the book. His shrewdness of discernment was a most valuable gift, which he possessed in its most signal degree, and his love of God's creatures and of every branch of Natural History, to which he contributed so much that was both useful and interesting, was very remarkably displayed in his writing. He had love for all God's creatures, but, perhaps, especially for birds. By this love, and by one particular chapter in which, while confessing that he did not pretend to understand everything they said, he described with great charm the variety of their voices and notes, and what they signified, he reminded one of two great men. The one was mythical perhaps, and of remote antiquity—the Greek, Melampus. Melampus rescued and brought up some young serpents whose parents his servants had inconsiderately destroyed. One day, while he was sleeping, these serpents nestled round his head, and when he awoke he found he had a new sense, an understanding of the different languages and chirpings of the birds. Without being far wrong, one might make some comparison between Gilbert White and Melampus. Coming nearer to our own times, less involved in the clouds of pre-historic doubt, St. Francis of Assisi was in some measure the forerunner of Gilbert White. There was a legend that he so loved the birds that they flocked around him while he preached sermons to them. Whether they understood him or not, the old legend at least showed this much—his love for those creatures, and his power of making them love him. These characteristics of Gilbert White could be gathered from his book, but the picture was filled up by a mass of family correspondence which had recently come to light. Mr. Edmund White, his nephew, who knew him very well, spoke of his 'pure character and religious principles. He had the peculiarity of attaching to him all of every age, but particularly young people, who listened with delight to his instructive tales.' This nephew said again, 'If I were called upon to say in what point he particularly excelled, I think I should say it was his mode of addressing his poor neighbours. His kind, philanthropic and charitable tones towards them, and his humane inquiries, always made them feel that he was their true friend.' Some people thought that White had nothing to attend to but birds, beasts, fishes, and insects; but that was a great mistake. Mr. Bell summed up the impression which he had received from all his researches in this way: 'His life may be truly said to have been passed in the constant and diligent fulfilment of the duties of his holy office continuously from the time of his taking deacon's orders in 1747 till his death in 1793.'"

After Mr. G. Darwin had proposed "Success to the Selborne Society," the Earl of Stamford proposed "Prosperity to the Hampshire Field Club," and in doing so remarked that

"During the last few months he had been engaged in the collection of reminiscences and unexplored documents relating to Gilbert White, who was a kinsman of his. Years ago an old woman of Selborne was asked what she remembered of Gilbert White, and answered: 'He used to walk about the lanes, tap-tapping with his cane, and stopping every now and then to brush the dust from off his shoes.' Gilbert White himself was not quite aware of the early history of his own family. He traced his pedigree back to one John White, of Swan Hall, in Oxfordshire, but, as a matter of fact, it could be traced back many generations further. He had the best authority for saying that an approximate likeness of White existed in the quarto edition of the 'Selborne.' Of the figures represented in the frontispiece to that edition, that represented as coming out of the tent was Thomas White, and that coming up the hill was Gilbert White. Benjamin White, the publisher of the book, had frequently told his son that, though the figure was not exactly a portrait, in general outline and appearance it was very like Gilbert White. He had found the whole of the letters written to White by John Mulso, his most intimate friend, and he hoped that before long they would be rendered accessible to the public."

Interesting as this information is to all disciples of Gilbert White, we must beg to differ from Lord Stamford in regard to the alleged existing portrait. Many persons suppose that the clergyman represented in the folding frontispiece to the first edition is intended for White; but this is not the case. Of the figures there introduced the first is the Rev. Robert Yalden, vicar of Newton Valence; second, Mr. Etty, brother of the vicar of Selborne; third, Mrs. Yalden; and fourth, Thomas Holt White, Gilbert's brother.

This information is derived from a footnote on page lviii. of the Memoir of White prefixed to Bell's edition of the work, and has the sanction of members of the White family, of whom representatives were present at the recent celebrations at Selborne, amongst others the Ven. Archdeacon White, who has recently returned from Queensland, and the Rev. Henry Masters White, of Oxford, both of them great-nephews of the famous naturalist.

Commenting upon this report, which appeared in the natural history columns of 'The Field' of the 1st July last, Lord Stamford the following week, July 8th, wrote as follows:—

> "Permit me to offer a slight correction of the report of my speech at Selborne which appears in your last issue. My informant as to the identity of the figures represented in the frontispiece of the quarto edition of the 'Selborne' is the Rev. John T. White, D.D., who is still alive, and who was represented at the centenary celebration by his daughter. John White, Dr. J. T. White's father, was actually concerned in the publication of the quarto edition, and well remembered his uncle Gilbert. It was John White who frequently told his son that the figures were intended to represent Gilbert White, Mr. and Mrs. Yalden, and Thomas White. Mr. Bell's identification of the figures appears to rest merely upon his own *ipse dixit*, as he quotes no authority. The representatives of the White family present at Selborne on June 24th were Mr. and Mrs. Holt White, with their eldest son; Mrs. Newport, daughter of Dr. J. T. White; Rev. E. Field, Rev. Henry Masters White, Ven. Archdeacon Gilbert White, Mr. William White, the Misses Martelli, and the Earl of Stamford.—STAMFORD."

In 'The Field' of July 15th his lordship supplied the following additional information:—

"I have just received (July 13th) from Mr. Christopher, who married a daughter of John White (nephew of Gilbert White), the following note:—'A Miss White, who was much older than my wife, and a constant resident with him (Gilbert), told my wife that all the family regarded Gilbert's likeness in the large print as a thoroughly good representation of him.'

"A misprint seems to have slipped into my letter in your last issue. The Ven. Henry Masters White (Archdeacon of Grahamstown) is no longer living. His son, the Rev. Henry A. White (Fellow of New College), was present at Selborne.—STAMFORD." [There was also present the Ven. Archdeacon White of Queensland.—ED.]

GILBERT WHITE AND HIS SUSSEX CONNECTIONS.

By the Rev. Prebendary H. D. Gordon, M.A.*

THE very enjoyable commemoration at Selborne, on June 24th, attended by a large body of naturalists from London, Southampton, and the South Coast, may seem a fitting tribute to a book—'The Natural History of Selborne'—set out by its gifted author with much hesitation and characteristic modesty. The late Mr. A. Holt White (great-nephew of Gilbert) wrote from Biarritz, February 19th, 1878:—"The book itself was published at the earnest solicitations of my grandfather" (Thomas White, F.R.S., who finally reviewed it in the 'Gentleman's Magazine'), as Gilbert said he "did not want the reviewers to laugh at an old country clergyman!" And yet from the first no book has been more favourably received; and White's literary life, a century after his death, is more undying than ever. It was said by one who knew the Englishman well, that he lived in the open air and hated books. White's 'Selborne' is a compromise in this respect, for however fatigued, weary, or sick the reader may be, he is always from the first page to the last out in the open air of his native country, hills, and dales. It has this characteristic stamp upon it, which may be found from Chaucer and Spenser to Pope in "Windsor Forest," in Cowper, Thomson, Collins, Wordsworth, and Tennyson. Another point, and one specially recommending it to men of few books, is that every line and description is perfectly simple and easily grasped. The whole book is short and idyllic, a model of note-books, giving the golden grain of a lifetime's observation in the happiest bloom of English language. Theocritus can certainly be traced in it. Even the absence of any reference to farming, for which Thomas White, in the 'Gentleman's Review,' pleaded that Gilbert was no farmer, is a gain instead of a loss to the English reader.

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* This article, by a valued contributor to this Journal, having appeared in a county paper, 'The West Sussex Gazette,' is likely to be missed by the majority of our readers, scattered as they are throughout the United Kingdom. It contains so much interesting information in regard to Gilbert White's family and associations, that we consider it deserves to be more widely read, and, as a matter of record, made more generally accessible.

It was well said by Lowell, quoted by Lord Selborne, that White's volume is the "Journal of Adam in Paradise." It might be said that it is a journal in country life of Lord Bacon's philosophy too—ever giving experiment and induction on things close at hand. It is probable that from his maternal Sussex ancestors White had this peculiar tendency of mind. Sir Edward Ford, of Uppark, pupil of Chillingworth, and a most practical natural philosopher, won the admiration of Charles II. and Pepys for his many ingenious inventions; and Gilbert White was a Ford by blood and by tendency of mind. No one who compares Sir Edward Ford's tracts with Gilbert White's book can fail to be struck by the resemblance.

In that pleasant "As you like it," at Selborne, on June 24th, the "Forest of Arden" was represented by "The Hanger," wherein, however, "the sweet bird's throat under the greenwood tree was mute," save that of one fitful Chiffchaff and some Jays. All went well under Lord Selborne's presidency. His lordship, in an admirable address, quoted much from the late Prof. Bell's edition of White's 'Selborne.' This book has several references, new to many readers, as to White's Sussex connections. For instance, Gilbert White writes in his diary, as given by Bell, August 3rd, 1754, "Servants at Chilgrove and Chichester, 6s." The Chilgrove friend was John Woods, Esq., White's authority about the (then as now) scarce Stone Curlew. Three connections of Gilbert White with the Woods family may here be mentioned. First, one of Gilbert White's sisters married a Mr. Woods, in the line of the late Rev. G. Woods, Shopwyke, and the present Master of Trinity College, Oxford; next, G. White had land, ("Scotland") on the Harting Downs to the S.E. facing Chilgrove, the property of Mr. Woods. The newly recovered Church Book of Harting discloses the entry made in the handwriting of a most upright parson, Rev. John Newlin, M.A.:—" April 16th, A.D. 1734. I appoint Mr. Robert Wood in my nomination to serve the office of churchwarden this year, in the parish of Harting. John Newlin, vicar." The same appointment is made in 1735 and 1736, but in 1739 it is "overseer" for South and East Harting, and spelt as now, "Robert Woods." This is a spelling which also occurs in his own signatures, April 12th, 1737, and 1743, though he had previously signed himself (1735) as "Wood." He was also overseer in 1747. He died after losing his wife, *née* Anne Luff, and was buried at Harting Church, Sept. 2nd, 1755. John White, father of Gilbert, was living in Harting, as Mr. Bell has shown. He states that Francis, the sixth son, brother to Gilbert, was born at Harting, March, 1729—entered thus in Harting Register, "1729, March 2—Francis, son of John White, Esq., baptised," and that the family did not leave Harting till Gilbert White was thirteen years old, 1733. This shows that Gilbert White must have lived at Harting for at least four years, and had his earliest impressions of nature here in Sussex. In the year 1734, when Mr. R. Woods was vicar's churchwarden, he would be *ex officio* a trustee of the Feoffee Charity; and a deed, apparently drawn by Mr. John White, a barrister (Gilbert's father), as co-trustee of this charity, has the signature of John White, and is in the possession of Mr. John Lever, C.C., of Kent House, East Harting, as chairman of the Harting Feoffees. Therefore, the Woods family and the Whites must have known one another, sitting at the same board as co-trustees of the Harting Charity in 1734, and must have been some of Harting's most influential residents. It is unfortunate that we cannot trace the residence of the Whites at Harting, but probably it was either at Tye-oak, East Harting, or at Woodhouse, their farm, till the end of the 18th century, on the N.E. corner of our parish, near Rogate and Harting Station. No doubt Gilbert White, who never seems to have lost a friend, would maintain his friendship with the squire of Chilgrove. It was his own geniality that made him say to Marsham, on first acquaintance, like fruit of new flavour, "Oh, that I had known you forty years ago!"

But on August 3rd, 1754, Gilbert White went on from

Chilgrove to Chichester, and there also he had many Sussex connections. Gilbert White was great-nephew to the great Chichester benefactor, Oliver Whitby, himself great-nephew to Sir Edward Ford, of Uppark, (why were there no Whitby boys at the Selborne pilgrimage, to celebrate their founder's great and greater nephew?) through whom he inherited lands in three places of Harting. One parcel was 13½ acres of land in the centre of Uppark, which he sold to Sir Matthew Fetherstonhaugh, the signature of G. White being among the archives of Uppark, as my late and gifted friend Mr. Weaver told me. Gilbert's mother, Anne Holt, was of true Sussex blood and a Sussex heiress; for she brought her son kinship with the Whitbys, Fords, and Hydes. The Benjamin Hydes—father and son, for there were two—were notable citizens of Chichester, connected by marriage with the two Oliver Whitbys. The picture of Benjamin Hyde, by Jansen, formerly at Selborne, and the blue garter and ribbon given him by Charles I., are possessed by Rev. E. Field, M.A., of Lancing College. There is an autograph of G. White, in possession of his nephew, Samuel Barker, Esq., Lyndon Hall, Rutland, wherein Gilbert White sets forth his lineage:—

> "Thomas Holt, father of Anne Holt, afterwards wife of John White (my father) was born at Petersfield in the county of Southampton. He was first Demy of Magdalen College, Oxford, but never Fellow. Afterwards preferred by the Duchess of Bedford to Streatham Rectory, where he died. He married Anne, daughter of Mr. Benjamin Hyde, of Chichester, a Russia merchant. The father of that Benjamin Hyde was also a Russia merchant, and according to the custom of the times traded personally to those parts, being called merchant adventurers. They went particularly to the White Sea. The above-mentioned Anne Holt, wife of John White, was born at Streatham, November, 1693; and died at Selborne, November, 1739.—(Signed) GIL-WHITE."

It is to be added to this Sussex historical sketch that John White and Anne Holt were married in the parish church of Rogate, in Sussex, September 29th, 1719. Professor Bell also showed me a draft of a codicil to Gilbert White's will in his own handwriting:—

> "Whereas I, the Rev. Gilbert White, of Selborne, in the County of Southampton, Clerk, have duly made and executed my last will and testament in writing, bearing date the second day of November last [1791]. And

whereas since executing my said will I have suffered a recovery of my estate at East Harting, otherwise Harting, in the County of Sussex, now I do hereby give and devise unto my —— all that my messuage, farm lands, tenements and hereditaments (no doubt Woodhouse), with the appurtenances, situate and being in the parish of East Harting, otherwise Herting, in the County of Sussex, called or known by the several names of Deane's, Boye's, Woodhouse, and Maxwell's, or by whatsoever other name or names the same or any part thereof is called or known. To hold unto him my said ——, his heirs and assigns, for ever. And I do declare this to be a codicil to my said will, &c., &c. Dated the —— day of January, 1792."

It may not be known that the greatest collection of relics of Gilbert White and his kindred is at present in Sussex. Rev. Edmund Field, M.A., showed his treasures at Lancing College to the White family, and gave a most interesting address on his great ancestor, which riveted the attention of all present. Mr. Field is a direct descendant of Gilbert White, and most materially assisted the late Prof. Bell in his edition of White's 'Selborne.' There were present the Earl of Stamford, Mr. H. M. I. Rashleigh Holt-White and his lady, Ven. Archdeacon White (Queensland), Mr. William White, architect (who produced a fine design for the water conduit proposed for Selborne), and Mrs. White, Mrs. and Misses E. and Agnes Martelli (Hampstead), and Rev. Henry Alcock White, Fellow and Tutor of New College, Oxford. These eleven represented the White family, distinguished by its attainment of no less than eight first classes at Oxford, the youngest member having recently obtained three first classes and two University prizes at Oxford. Canon Lowe, Warden of Lancing College, was also present.

The room abounded with relics of the White family, the Selborne treasures of Prof. Bell, and many others added, pictures of Charles I., wearing the Oxford blue of the Garter, and Henrietta Maria, his queen; a magnificent Jansen of Benjamin Hyde, formerly at Selborne, and already referred to; also of the Rev. Sampson White, head of the great Hampshire family of White, descended from John White, Bishop of Lincoln, and subsequently of Winchester, and Warden of Winchester College in Mary Tudor's time (1541–1554). Ultimately the White family claim the royal Plantagenet blood of Henry III. Space would fail to give an idea of the vivacity and wit with which the accomplished lecturer handled every scrap of antiquity, from the sword of Sir

John White, Lord Mayor of London, 1563, and the pale Cambridge blue silk ribbon that Charles I. gave to Benjamin Hyde, down to the light cane high stool on which Gilbert White sat to write his famous book; for an armed, or even a backed chair, his Spartan industry would not tolerate. Some of the last words and thoughts of the great naturalist, Mr. Field said, were on the words, "I know that my Redeemer liveth"—words which he seemed to have repeated as a dying watchword, as Bede spoke of his "forthfaring" before his death. It was announced that the early private letters of Gilbert White to "Tom Mulso," his college friend, and Miss Hester Mulso, his sister, the heroine of the lines written by "Timothy," the Sussex Tortoise, from Lewes [Ringmer], would probably be recovered for publication. The shell of "Timothy" is now in South Kensington Museum.

A very interesting memorial of Gilbert White, which has recently come into the writer's possession, viz., a copy of Hudson's 'Flora Britannica,' 1752, with Gilbert White's autograph on the first page and his private notes, in ink and pencil, of all the flowers found at Selborne, was exhibited, and was acknowledged by Messrs. Field and Holt-White, and Mrs. Martelli, to be genuine. It shows that in 1762 Gilbert White was no mean botanist, but well posted up in the latest book applying the Linnæan system to the Flora of Great Britain.

For the parentage of Homer seven cities strove. It ought to be an amicable arrangement between Sussex and Hants that Gilbert White belonged to both, as a sojourner and landowner, an illustrious example of the old historical adage that people born on the confines of two races are apt to produce men eminently gifted. Border men from Chaldæa and also in Egypt, in their contacts and rivalries produced in meeting places of the highways of mankind, or sometimes in river basins, those cradles of civilisation, leaders of thought and types of higher life. Aristotle lived from his earliest life, steeped so to say, in the many streams of different kindreds of men. Mahomet was born at Mecca, the meeting place of the tribes. Chaucer, the vintner's son, was born in the throng of London; and Shakespeare's school was London also. Argos and Mycene must have crowned mutual altars for their great native Hercules or Herakles; and some day Sussex may set up some memorial—a most delicate subject—of that sweet and ever vernal philosopher of nature whom Lord Selborne so well described. What shall it be, when, and where?

NOTES AND QUERIES.

MAMMALIA.

Protection of Kangaroos.—A year or two ago I furnished a note on the threatened extinction of the Kangaroo. A committee of local naturalists worked hard to prevent this, and finally, after encountering a good deal of opposition, succeeded in securing the appointment of a close season extending from November 1st to April 30th. These are our summer months, during which time skins are of little commercial value, as they become sunburnt while drying. We have also secured the insertion of a clause in the Act providing for the proclamation of districts within which Kangaroos are to be protected for any period. By means of this clause we have obtained the proclamation of Kangaroo Island, a large island off the mainland, and part of our western coast near the great Australian Bight. The importance of the matter is now being recognised in Victoria and New South Wales, and possibly Kangaroos will be protected in due course throughout all the Australian colonies. It is but fair to mention that in this work we have had the hearty co-operation of American tanners and local exporters of skins.—A. F. Robins (Adelaide, S. Australia).

Food of the Squirrel.—Amongst the food-stuffs of the Squirrel may be reckoned wall-fruit, such as apricots. In this district I have heard them accused of stealing the latter, but was somewhat sceptical until the other day, when I caught a Squirrel in the very act—red-handed—taking an apricot from the garden-wall. On two sides of the garden there are oaks, and in one place the branches overhang and touch the wall; the Squirrels use this as a bridge. They prefer apricots which are somewhat hard and not such as are fully ripe. Mr. J. A. Harvie-Brown ('The Squirrel in Great Britain,' p. 178), on the authority of Captain Dunbar-Brander, includes kernels of apricots amongst their food; but it is not the kernel they are after, but the fruit, or pulp, as I can testify by having watched one, through a glass, holding the fruit between his paws and deliberately devouring the pulp till all was finished; the kernel was then dropped to the ground, and I forward two for the Editor's inspection to show that they are not even gnawed. I think I have succeeded in stopping the marauders (without resorting to extremities), by cutting away the boughs of the oaks where they touch the wall.—J. Cordeaux (Eaton Hall, Retford). [The apricot-stones forwarded completely justify our correspondent's remarks.—Ed.]

Swimming Cats.—The domestic cat is proverbially averse to a wetting, and although some members of the family take to the water readily enough, I have always believed with Gilbert White that "pussy of all quadrupeds is the least disposed towards water." Hearing therefore that two young cats at the Swan Baths on the Norwich river were accomplished swimmers, I called upon Mr. Ransome, their owner, who very kindly exhibited the natatory powers of one of them for my benefit. The younger of the two, only two months old, having already crossed the river twice, he hesitated to put it through its performance again, for fear of tiring it. I therefore had not the pleasure of seeing the two swim side by side; but its fellow, a month older, he took across the river in a boat, and returning to where I stood called it to his side, when puss, apparently without the slightest fear, and without hesitation, took to the water and swam with head well up, very lightly and rapidly across the river, which is certainly quite twenty yards wide, crossing straight over, notwithstanding a strong current which was running. It left the water by the bathing steps without assistance, and apparently not at all fatigued, although it had then crossed for the third time that day. Its chief care on landing seemed to be to dry its feet. Mr. Ransome is the teacher of swimming at the Baths, and he has certainly been most successful with his little pupil, which he told me he trained gradually and purely by persuasion. I hear that since I saw this curious feat, some thoughtless person threw one of the kittens into the water, after which it was shy for a time, but since then, by kindly persuasion, it has quite regained its former confidence.—THOS. SOUTHWELL (Norwich).

Variation in the Colour of Field Voles.—In reply to Mr. Service's enquiry on this subject, I may say that on July 19th I saw, alive, at Mr. Bristow's, taxidermist, of St. Leonards-on-Sea, a pure white variety of the Short-tailed Vole, with black eyes. It was brought to him on July 13th, by a boy who caught it at Hollington, about two miles from here. It is a full-grown specimen, and is still in Mr. Bristow's possession.—GEORGE W. BRADSHAW (The Memorial Studio, Hastings).

Water Shrew in S.W. Lancashire.—In April last I was fortunate in being able to watch for a short time the habits of this rather seclusive species. It was industriously diving repeatedly from the surface in the middle of a stream pool, and apparently feeding on insects. On my approach the Shrew immediately made up-stream, cleverly wriggling with distended body under water, and making the most of such covert as was afforded by submerged weeds. With the assistance of my brother, we chased it under a stone, and eventually captured a nice variety of *Crossopus fodiens*. Description:—Sex, male. Body stout; general line of the upper parts greyish black; lower parts whitish grey; chin, throat, and belly whitish grey, becoming slightly yellow at the abdomen. Eyes blue, and small. Fore legs silvery grey; hind legs slightly darker. Upper and under sides of tail (which is flat) correspond in colour with the upper and under parts of body, and is ciliated with strong white hairs. This specimen has been mounted, and is intended for the collection in the Museum here. The habits of this pretty little mammal render observation difficult, and I have only occasionally met with the species before in this district, though, no doubt, if properly looked for, it will be found distributed generally throughout the county.—C. E. Stott (Bolton-le-Moors).

BIRDS.

The Marsh Warbler in Oxfordshire. — In August last year (Zool. 1892, p. 303) I described the discovery of *Acrocephalus palustris* in an osier-bed near Chipping Norton. We did not succeed in finding the nest, owing to the large area of the osier-bed, and the want of a point of vantage from which to watch the movements of the birds. The osiers were cut last winter, and the birds have not returned to it; their place has been taken by Grasshopper Warblers, which in the hot evenings have been making the air vibrate all around with their incessant reelings. On June 20th it occurred to me to make a careful examination of another osier-bed, about half-a-mile further up the railway line. Here the osiers were uncut, and here, too, the embankment of the railway enabled me to look directly down on them. I soon heard the familiar song, and saw the birds once or twice. Next day, by watching from this embankment, I was able to make a guess at the position of the nest, and penetrating into the osiers, I found it at once. It was not yet finished, and during the next two or three days I was able to watch its progress. It was about three feet from the ground, slung between the willow-shoots in such a way that they were not worked into the sides of the nest, but only through the outer rim; the nest thus looked like a little basket suspended by three or four handles. It is rather a more solid structure than those I have seen in the Alps; a quantity of green moss was added to the lower part of its exterior after I first saw it. The body of the nest is, however, almost entirely of dried grass, with a few horsehairs in the lining. On the 24th Mr. A. Holte Macpherson came down from London to see it, and that night luckily the birds laid an egg, which he found before breakfast in the morning. Next day was Sunday, when the predatory ploughboy roams afield in quest of eggs, and we had to organise a watch during the whole of that long day. On the 26th another egg was laid; and as I was about to leave England for three weeks, I decided to take the nest and two eggs for the Oxford Museum. This has been successfully accomplished by cutting away the saplings above and below the nest; and I hope the birds may get over their disappointment and build again. The eggs are exactly like those Mr. Aplin and I found in Switzerland; greenish white in ground colour, with many dull purplish spots and blotches, especially at the larger end. The nest was about twelve paces from the edge of the osier-bed, on dry ground, but close to a ditch of running water. It is in Oxon, but within twenty yards or so of Gloucestershire. Adjacent to it is a field of wheat, and hard by is also a field of beans, in one corner of which, oddly enough, a Reed Warbler—a bird almost unknown here hitherto—has sung every day to me as I passed it on my way to the nest of its cousin.—W. WARDE FOWLER (Kingham, Chipping Norton).

Hybridity.—I should be much obliged to any readers of 'The Zoologist' who will send me notes of any facts which have come to their knowledge respecting hybridity, the interbreeding of species. I should also be grateful for hybrid specimens for examination and to illustrate my work, 'Wild Hybrid Birds,' of which four parts are already published, and shall be glad to pay all expenses of transit.—A. SUCHETET, Bréauté, par Goderville (Seine Inférieure).

The Common Sandpiper nesting in the Eastern Counties.—It does not appear, so far as I can ascertain from the published accounts, that the Common Sandpiper, *Totanus hypoleucus*, has so far been recorded as nesting anywhere in the Eastern Counties between the Thames and Humber, its occurrence being restricted to a double passage in the spring and autumn. It is therefore with some satisfaction that I am able to record it as nesting recently in Lincolnshire. The Rev. C. W. Whistler, of Theddlethorpe (an excellent naturalist), informs me that on June 16th, 1890, he and his brother found two nests near each other in a wide depression, or marsh, amongst the Lincolnshire sand-hills. I am well acquainted with the locality, which, except in very dry years, holds shallow pools of water, of considerable extent, surrounded by sedges and rough herbage, with patches of bare shingle or sand. The nests were on slightly elevated ground—an island when the water is out—and they were somewhat pyramidal in shape, with shallow depressions in the centre. In both cases the young had left the nest, and the egg-shells were found near one of them. From the actions of the two pairs of birds, there could be no doubt the young were close at hand, one of the parents doing the broken-wing trick to perfection in endeavours to draw the intruders from the spot. A few Sandpipers frequent the Trent between this county and Lincolnshire through the summer, and I have seen two, and sometimes three, on the Idle at this place throughout the spring and summer months up to this date, but without any proof of their having nested.—JOHN CORDEAUX (Eaton Hall, Retford).

Green Sandpiper in Lincolnshire in June.—On July 1st I saw at Mr. Fieldsend's shop at Lincoln an adult Green Sandpiper, *Totanus ochropus*, which was brought to him by a labourer whe stated that he shot it on June 22nd, from a flock of six flying about a stream at Cold Hanworth, about nine miles N.N.E. of Lincoln. There can be no doubt that the Green Sandpiper has occasionally remained to nest in England, and the occurrence of six together in Lincolnshire at this date is suggestive of a family party, reared somewhere in this county.—JOHN CORDEAUX (Eaton Hall, Retford).

Curlew Sandpiper in Co. Donegal.—As the Curlew Sandpiper, *Tringa subarquata*, is not included in Mr. Chichester Hart's list of the birds of Donegal (see Zool. 1891, pp. 421—424), it may be well to report that I shot a bird of this species on the 26th December, 1892, on the margin of Lough Kiltoons.—J. STEELE ELLIOTT (Dudley).

The Green Sandpiper in S.W. Scotland.—The Green Sandpiper is a tolerably regular, but always extremely scarce, visitant to South-Western Scotland. On the 27th December, Mr. Mackay (who as a taxidermist is worthily filling the blank made in Dumfries by the death of Mr. William Hastings) very kindly brought for my inspection a nice specimen of this species, shot a day or two previously by a gunner on Conheath Merse. Another was shot at the same time, but was too much injured for preservation. I had not seen the species locally since January 6th, 1885, when one was brought in to the late Mr. Hastings that had been shot the day before in Kirkmichael. The late Mr. McKenzie, Barnhill, possessed a specimen that was shot on the margin of the pond in Terregles Park. There is a very interesting notice in Sir W. Jardine's 'British Birds' of the occurrence of a number of this species at Jardine Hall and the vicinity. The species has also been shot near Castle-Douglas, and through the kindness of Mr. John A. Harvie-Brown I have been furnished with the following extract from the Catalogue of British Birds collected by Mr. W. Smellie Watson, copied from the original MS., now in the Museum of the University of Edinburgh :—" This beautiful little bird I shot on the marshy grounds behind Carlinwark House, Castle-Douglas, when shooting Snipes. On the wing it [*i.e.*, the back] appeared so white that it resembled a snowball, and its flight was not unlike that of a Common Snipe, but not so quick. It is a solitary bird, and not common. I did not meet with another the whole day, although I went over a very extensive marsh. None of my friends in that neighbourhood had ever met with one of the species before." Mr. Smellie Watson gives no date for this record, but the Catalogue was written in 1836.—R. SERVICE (Maxwelltown, Dumfries).

Nesting of the Quail in Somersetshire.—A farmer who lives close to the Moor, a few miles from this town, and whom I had asked to obtain for me the eggs of the Water Rail, should he come across a nest, brought me on July 19th, the egg of a Quail to know if this was what I wanted. He found the nest in a field close to the Moor when cutting the grass, and it contained nine eggs. They were slightly incubated, as he unfortunately broke one to see.—H. St. B. Goldsmith (King's Square, Bridgewater).

Quail in Worcestershire.—Whilst driving near the small village of Churchill, on the 29th June last, I heard a Quail calling lustily in a field of oats near the roadside. The remarkable weather during the period of migration this year seems to have been favourable to these birds, for they have been reported from many localities, and in some of them are said to be numerous.—J. Steele Elliott (Dudley).

The Quail in South-West Scotland.—There is reason to believe that at the end of last and beginning of this century Quails were tolerably numerous in the south-west of Scotland. From then till the fifties they visited us in gradually lessening numbers, and finally disappeared as regular summer visitors. Sir Wm. Jardine ('British Birds,' vol. iii. p. 106, 1844) says that "Thirty years since (say 1813) they were tolerably common, and regular in their return, and even in the south of Scotland a few broods were occasionally found." Again, in the 'New Statistical Account of Dumfriesshire,' the same naturalist states that Quails are "occasionally met with in the parish of Applegarth, at the the time of migration, September and October. In 1819 they bred there and produced large bevies." I find in an old natural-history periodical, which came out at intervals in 1857–58 and then failed, a couple of interesting letters referring to Quails above the signature of "W. S. T." (the initials, I believe, of a Mr. Thorburn, who then resided near Maxwelltown). The following extracts are from the letters referred to:—"I have lately been informed by a gentleman who is the proprietor of a portion of Lochar Moss, that fifteen years ago (say 1842) not an individual of this species was to be seen in the Moss. Since that time two or three pairs arrived yearly, until recently he has observed that the number of immigrants have increased. From 1853 to 1856 the piping of the Quail was regularly heard, and several individuals were seen, and in the summer of 1854, in cutting a field of grass, a mower came upon a nest containing about a dozen eggs, with the bird crouching close to the ground." In a subsequent issue of the periodical referred to, "W. S. T." writes, *inter alia*:—"I lately sent you an account of Quails having been discovered in Dumfriesshire in 1854. I have again the pleasure of informing your readers that this year (1857) another brood has been seen." In Galloway, Quails were formerly much better known than to eastwards of the Nith. Indeed, it may be said that the Wigtownshire folks were quite familiar with these birds, for Messrs. Gray and Anderson, in their 'Birds of Ayr and Wigtown,' observe that it is known to the country people by the name of "Wet-my-feet," these words being supposed to be expressed in the sounds emitted by the birds on summer nights. In the 'Old Statistical Account' (parish of

Buittle), there is a statement that Quails were very abundant in Wigtownshire at that time (1795), and the writer (Rev. G. Maxwell, of Glenarm) adds, in reference to Buittle parish, that Quails "were hardly known a few years ago, although now abundant." The species is included amongst the birds of Colvend by Mr. McDiarmid in his useful little history of that most interesting parish. Mr. Peter Adair, in a recent number of the 'Annals of Scottish Natural History,' published a good account of the former abundance of Quails in Wigtownshire, and gave a long and most extremely interesting series of details of their disappearance within the last quarter of a century. In Dumfriesshire, as has been shown, their annual visits seem to have ceased somewhat abruptly about the end of the fifties, and in the Stewartry I have every reason to believe they came for a few years longer, and (so far as I know) one shot on Barnhill of Terregles in September, 1874, and another also in autumn within the last year or two, shot on Shambellie, are the only occurrences since the middle of the sixties. The foregoing notes will give those who are interested in such a subject a general idea of the status of the species in south-west Scotland. In the course of a long experience of birds and their ways throughout these southern counties, I have never seen the Quail alive in a wild state, nor heard its call until June of the present year, when Mr. Robert Armstrong, tenant of the farm of Rotchell, sent me a message to the effect that in mowing hay his men had come upon a couple of nests containing eggs, the like of which he had never seen before, adding that he had an idea they might be those of Quails. Of course I lost no time in getting to the spot, and a glance at the nests and eggs was sufficient to assure me that Mr. Armstrong's surmise was quite correct. The nests were discovered just as the hay was being cut, and the motion of the scythes frightened the sitting birds. Neither Mr. Armstrong nor I wished to take the eggs, or to disturb the birds more than could be helped, and so the eggs were let alone after a brief examination of the nests and surroundings. One nest contained five eggs, and was a mere hollow scraped in the soil with almost no lining at all; the other one contained nine eggs, and was tolerably well lined with pieces of moss and small grass fibres.—R. Service (Maxwelltown, Dumfries).

Nesting of the Grey Wagtail and Dipper in Surrey.—On April 15th of the present year my friend Mr. Elliot and I discovered a nest of the Grey Wagtail, *Motacilla boarula*, with four eggs, in the neighbourhood of Wimbledon. Owing probably to some new work being commenced within a few yards of the nest, the eggs were deserted and stale, two of them adhering to the bottom of the nest, although on blowing them I found that incubation was some five or six days advanced. I felt sure from a previous similar experience that when these deserted eggs were removed from the nest, the bird would return and lay afresh, and on Mr. Elliot visiting the spot some two days later he found the nest contained two fresh eggs, much lighter in colour than the first four. I trust therefore that a brood was eventually reared. The nest was built behind a tuft of nettles growing from the wall of a sluice. Both nest and eggs were of the typical Grey Wagtail type, and although I did not see the bird myself, it was observed and identified without doubt by Mr. Elliot, who knows the species well. I have obtained the nest and eggs of the Grey Wagtail in Somerset, and believe it has been obtained also in Hampshire, but I know of no previous actual record of the nesting of this species in the south-eastern counties of England. I discovered an old nest of the Dipper, *Cinclus aquaticus*, in a disused culvert. It was just such a spot as the Dipper loves to select for its home, but unfortunately there were no signs of the nest being renewed this year, and from its appearance was probably two years old. As I can find no previous notice of the Dipper nesting in any of the south-eastern counties, this record may stand for what it is worth until somebody is fortunate enough to actually discover the eggs or young. Every ornithologist will have noticed the partiality of the Dipper and Grey Wagtail for similar localities, on which account their general distribution is generally very similar. It is somewhat remarkable, however, that this companionship should be carried so far as the nesting of the two species within a few yards of each other in a locality where practically neither had been found breeding before.—ROBERT H. READ (The Grove, Ealing).

Black Tern in Yorkshire.—The keeper of the Hoyle Mill-dam (about seven miles from Wakefield) gave me, for identification, an adult Black Tern, *Hydrochelidon nigra*, in good spring plumage, which he shot at the dam on May 15th. It measured 22 inches from tip to tip of extended wings, and was one of a large flock which came down to the dam on the evening of that date, and stayed there about half-an-hour, skimming over the water and frequently touching it as they flew. While they were there all the Coots retired into the rushes, and there was neither a Swallow nor a Swift to be seen there. These Terns came from the N.E. and flew off in a south-easterly direction.—C. I. EVANS (Ackworth, near Pontefract).

Ornithological Notes from the Alps.—At the end of June it was my good fortune to start with Mr. Warde Fowler for Switzerland, where we spent twelve days in search of birds, and where we found a few nests, a description of which may be of interest. I need hardly say that without Mr. Fowler's experience I should have found very few of the birds we saw, and it is only at his wish that I venture to write this account. At Stanzstadt, where we commenced operations, is a large expanse of marshy ground where meadow-sweet (*Spiræa ulmaria*) and other tall plants grow in abundance. Here the Marsh Warbler (*Acrocephalus palustris*) was common; and though several evidently had their young about with them, we succeeded in finding one nest of this species with eggs. This was placed in the stems of a tall plant, apparently a kind of nettle. Twelve stems of this plant passed through the rim of the nest, which was made almost entirely of dried grass, with very little horsehair. There was no moss, as there was in the nest found this year at Kingham by Mr. Fowler, which has already been described in 'The Zoologist.' The hen was sitting on five beautiful eggs, and the cock, who was singing quite close to the nest, continued his song only a short distance away, even after we had flushed the hen from the nest. The Engstlen Alp seems to be a favourite place of the birds, and there I was glad to make the acquaintance of many that were quite new to me. The Alpine Pipit (*Anthus spipoletta*) is abundant, and his cricket-like song is to be heard throughout the fragrant pastures. By a piece of good luck we found a nest and eggs of this bird. It was placed on a steep grassy slope, and was sheltered by a very small tuft of Alpine roses; both in construction and position it was much like the nests of other pipits which I have seen. The hen was sitting on five eggs which were marked not unlike those of the Rock Pipit (*Anthus obscurus*), but were of a greenish colour. I also caught a young bird scarcely able to fly, and noticed that its throat was creamy white, and that it was much spotted on the breast. The inner webs of two feathers on each side of the tail were white, and the legs and feet were yellow. One morning I clambered up the steep grass slopes to try and find a nest of the Alpine Accentor (*Accentor alpinus*). Before I had gone very far I found a pair of these birds carrying food, and after a good deal of watching, succeeded in finding the nest. The cock and hen were so much alike, that I could not see any difference; they moved about silently, flicking their wings in a restless way, and after I had been watching them for some time, one flew away and the other deliberately ate all the food it was carrying. In a short time, however, both returned, and one soon went to feed the young. The nest was well concealed under a rock which projected from a very steep bank and was covered with grass. Some of the grass hung down in front and formed a screen. It was substantially made of short bits of dry grass and moss, and contained a few feathers. There were four young, whose feathers were only just beginning to grow; when they opened their mouths, crying for food, I was able to see that there were two black spots at the back of their tongues. Higher up, about the precipices, were numbers of Alpine Choughs (*Pyrrhocorax alpinus*). I came upon two young birds whose bills and legs were black. The old birds kept wheeling round with their beautiful flight, sometimes uttering a curious whistle, and I saw several flying in and out of crevices in the rock where they had their nests. Perhaps the most delightful nest we saw was that of a Teal (*Querquedula crecca*). Lined with down, and containing six eggs, it was placed in the midst of a bush of Alpine roses, close to a very small pool of water, and at some little distance from the lake. By crawling carefully we managed to get within a couple of yards of the nest before the hen bird fluttered away, close to the ground, and went on to the lake. On a precipice near Meiringen we were much delighted to observe the Wall-creeper (*Tichodroma muraria*). We saw the bird alight on the rock and creep about with little jerks, disappearing at times into a crevice. The rock was fully exposed to the rays of the sun, and through our glasses we could easily distinguish the crimson on the bird's wings. What especially surprised us was its flight, which so much resembles the flight of a small falcon, that when it first left the rock we neither of us thought it was the Wall-creeper that had gone, and only perceived that this was the case when the pseudo-falcon returned, and again began to creep up the rock. At Engelberg Mr. Fowler found the nest of a Grey Wagtail (*Motacilla boarula*) in a curious position. It was placed on a beam inside a boathouse by the side of a small pond in the hotel garden. The nest was large and untidy, and contained six young which the parents were busy feeding. We saw many other birds which were quite new to me, and heard some songs whose authors have yet to be identified; which only makes us look forward with more eagerness to another year, when we can again pay a visit to such a delightful country.—H. C. Playne (Oxford).

The Greater Spotted Woodpecker killing a young Pheasant.—While staying lately in Gloucestershire I heard that the keeper had just shot a bird which he called a "French Eagle," and which he said had carried off one of the young Pheasants from the front of the coops. I asked to see the bird, and it turned out to be a Greater Spotted Woodpecker! I "pooh-poohed" the story, and suggested explanations; but when I saw the keeper, the next day, he stuck to his story, said he saw the bird fly down, pick up a young Pheasant, fly with it up into a tree, and then and there smash the head with its bill, and that he then shot it with the little Pheasant in its claws. The latter, which I saw, was covered with blood. Has any such habit as this been recorded of any species of Woodpecker? *Eagle*, of course, is evidently a corruption of *eccle*, *heccle*, or *hick-wall*, the local name for a Woodpecker. — J. H. Belfrage (Littleworth Lodge, Esher).

[Some years ago, when pheasant-shooting near Uckfield, in Sussex, we saw a defunct Green Woodpecker strung up with several Jays, Kestrels, and Magpies upon a "keeper's tree." On pleading with the head-keeper in defence of the Woodpecker, he assured us that he always shot these birds when he had a chance, as they killed his young pheasants. He was not prepared, however, with any evidence in support of this charge (never having caught one in the act), and we came to the conclusion that the real culprits were Jays, whose propensity in this direction has been elsewhere satisfactorily proved. Mr. Borrer, in his 'Birds of Sussex,' writing of the Greater Spotted Woodpecker, says, "I am not aware that it has any local name," but both in Sussex and Hampshire we have often heard keepers and beaters call it "French Magpie," a name by which it is known also in Devonshire, though in other counties this name is bestowed upon the Grey Shrike.—Ed.]

Preservation of the Kite in Wales.—I write to ask if nothing can be done on behalf of our unfortunate Welsh Kites. I have lately visited a remote district where they still linger. Ornithologists will understand the interest excited by the first view of these fine birds upon the wing. Their flight is like the Buzzard's stately sailing, interrupted now and again by a few slow flaps suggestive of the Heron. The wings are longer and more pointed than those of the Buzzard, and show more "elbow." Two pairs were met with; a few others might possibly have been found had time allowed of further search. A farmer showed me the eggs of the first pair, which he took about April 25th, at the request of a gentleman collector, who was expected to call for them shortly. He also pointed out the nest, which would have filled a large wheel-barrow, and was almost certainly more than one year's accumulation. It was in a thin wood of "spear" oaks, about thirty-five feet up a slender tree of some ten inches diameter, just at the point where the upper branches diverged. It was composed of oak and birch sticks, and was from 2 ft. 3 in. to 2 ft. 6 in. across; 2 ft. 6 in. deep. After being disturbed here, the birds made an attempt to nest at a spot about half-a-mile distant, but were apparently driven off by crows before any eggs were laid. At the date when I saw them (May 23rd) they may have been building again, but the hen was not sitting. I was shown the nest of a second pair on May 23rd. It was in a similar tree, but only about twenty feet from the ground. The eggs had been taken a day or two previously, as the bark scratched by climbing-irons indicated. The lining of the nest in all cases consisted chiefly of rags and newspaper, once with the addition of a blue sugar-bag. I was told that another pair had built in a tree which grew from the side of a deep ravine, and that the female bird had been killed on the nest by a stone thrown from above. I cannot confirm this, though the description was so circumstantial as to leave little room for doubt. Unless something be done, the birds are doomed in this locality. While the trees are still bare, they build a nest which can be seen a mile away, in a tree which any schoolboy can climb. Shepherd lads borrow a gun to shoot the old bird from the nest, or take the young ones, which, bedraggled and with wings cut, mope about the stables and kennels of the neighbouring gentry. Others stray down to the pheasant preserves, and get trapped or shot. There are no trees tall enough to give them the least security in nesting; no large preserved woods where, under protection of landed proprietors, they might find a refuge. The small occupiers bear a grudge against them for the occasional loss of a chicken. One gentleman, whose keeper persecutes them, might perhaps be induced to give orders for them to be left alone. If one small wood could be protected, the safe breeding of at least one pair would be secured. The Raven and Buzzard still hold their own fairly. I have known nine nesting sites tenanted this year by the former bird, and could point out a district where a dozen pairs of Buzzards may be found breeding within a three-mile radius; but the Kite, from its mode of nesting, is more exposed to danger. The farmer who showed me the eggs had been familiar with Kites in this locality for thirty years or more. He told how, ten or twelve years ago, he had counted fourteen Kites as they came to roost in the wood where the first nest was built, and how he once saw nine perched on a tree in a neighbouring gulley. Once also he had seen an albino Kite. I fear that, unless naturalists will exert themselves on its behalf, the end of the century will see the extinction of the Kite in Wales.—J. H. Salter (University College, Aberystwyth).

[We entirely concur in the remarks of our correspondent, and would willingly co-operate in any scheme to secure the protection of the few pairs of Kites which still linger in their ancient breeding haunts. Perhaps a memorial to the landowners urging forbearance on the part of their keepers, signed by a number of naturalists, might have the desired effect.—Ed.]

Fertility of the Meadow Pipit in Norway.—Having lately found seventeen nests of *Anthus pratensis* on the Norwegian fells, I give the number of eggs found in them, showing an average of 5·53 eggs per nest:—3 nests with seven eggs each; 7 with six; 4 with five; 2 with four; 1 with three. In every case the bird was flushed from the nest, which indeed led to its discovery. In the last case the bird would doubtless have laid more than three eggs. All the eggs were found in June. In Norway the Meadow Pipit, as a rule, nests only on the fells, not on low ground as in England, though on one occasion I found a nest near Stavanger less than 200 feet above the sea.—John P. Thomasson (Woodside, Bolton).

Hobby in Worcestershire.—On May 7th, whilst strolling through one of the largest coverts in this county, I found a male Hobby with its wing broken, and, strangely, it was fluttering beneath the nest of a Sparrowhawk containing two eggs. I have since sought diligently to find them breeding here, but in vain, although I have enquired from the keepers, who know of two sorts of hawks only. Still I hope to meet with the bird again, and I think a reward offered for a nest shown, and a further reward when proof is given of the young birds having flown, will go some way to protect this little falcon from its otherwise certain doom.—J. Steele Elliott (Dudley).

Montagu's Harrier nesting in Cambridgeshire.—It may interest some of your readers to know that Montagu's Harrier, *Circus cineraceus*, has been breeding once more in the fens near Cambridge this summer.

There were at least three birds, two males and one female, of which I had a good view. The nest of one pair was found, and consistsd of a slight mat of dried sedge, with a few small sticks, about two inches thick, round the outer edge. It was of an oval form, measuring 18 inches by 12 inches, with a slight rounded depression in the centre 6 inches across, in which were three eggs.—F. E. Swainson (Jesus College, Cambridge).

Crane in Suffolk. — An adult Crane, *Grus cinereus*, in somewhat abraded plumage, but apparently a wild bird, was shot at Benacre Hall, near Lowestoft (Sir Alfred Gooch's place), on the 27th of June last, and is at present in the hands of Mr. Bunn, taxidermist, Lowestoft, for preservation.—E. Butler (Herringfleet Hall, Lowestoft).

INSECTS.

Origin of the Name "Dor-beetle."—I have looked into a good many entomological works with a view to ascertain the origin of the name "Dor-beetle," but without success. The popular impression seems to be that the name is derived from the sound produced by the insect when on the wing. Ogilvie, in his 'Imperial Dictionary' (ed. 1882), gives "Dor, dorr, from A.S. *dora*, drone," and adds:—"The name is probably imitative of the sound the insect makes." Under the heading "Dormouse," Professor Skeat, in his Etymological Dictonary,' observes:—"The prefix is from a prov. E, *dor*, to sleep, appearing in *dorrer*, a sleeper, or lazy person." A very different interpretation is that given by Archdeacon Nares, in his 'Glossary' (1822). "To give the *dor*," he says, "is to make a fool of a person; to pass a joke upon him or to outwit him." The word is used in this sense by Fletcher (' Purple Island,' v. 4; vii. 25), and by Ben Jonson (Bart. Fair. iv. 2), in the line:—"Here he comes, whistle; be this sport called *dorring* the dott'rel." This, to an ornithologist, is a very suggestive line, in view of the ancient method of outwitting dotterels, for it conveys a hint that the expression in regard to the *daring* of larks, used by Shakespeare (Hen. VIII. iii. 2) and others, may be a corruption of *dorring*. But to return to the *dor*-beetle. Halliwell, in his 'Dictionary of Archaic and Provincial Words,' has "*dor*, a drone or beetle," and "to *dor* or to give the *dor*, to make a fool of one, corresponding to the modern *hum*, to deceive." But there is yet another and a very different explanation which has been offered by Mr. R. G. Haliburton, incidentally, in some 'Notes on a Tau Cross on the Badge of a Medicine Man of the Queen Charlotte Isles.' Mr. Haliburton says this badge is noteworthy, as Queen Charlotte Isles form one of the most isolated groups of the Northern Pacific. They lie off the west coast of British Columbia. This symbol was used by the Indians on large sheets of copper, to which they assigned a high value, and each of which they called a *Tau*. The connection of that name with the symbol is world-wide. Our T is simply the *tau* symbol, and is called *tee* or *tau*. The medicine men represent the *tau* sometimes on the forehead. The ancients used to mark the captives who were to be saved with a *tau* or cross; Ezekiel refers to this, and the word he uses for "the sign" to be marked on the foreheads of them that are to be saved, really is the "*tau*" or "cross." No one had divined why the *scarab* was so sacred. He was led to a solution by seeing an exaggerated *tau cross* on the back of a scarab. On looking into the Egyptian name for the scarab, he found it to be *tore*, and that the sutures on the beetle form a *tau* cross. Wilkinson represents a god with a scarab for a head, one of the names of which was *Tore*. Apparently the same name is applied in this country by our peasantry—*tor-beetle* or *dor-beetle*. The use of the pre-historic or pre-Christian cross is world-wide. This is an ingenious and plausible explanation, and one that deserves to be made known to English naturalists; but whether it will be acceptable to those of them who are philologists is a question upon which some expression of opinion would be interesting.—J. E. Harting.

NOTICES OF NEW BOOKS.

Castorologia: or the History and Traditions of the Canadian Beaver. By Horace T. Martin. 8vo, pp. 238. With illustrations. London, Stanford; Montreal, Drysdale & Co.

Under the infelicitous name of 'Castorologia,' almost as suggestive of a disagreeable plant as of an animal, Mr. Martin has brought together a good deal of interesting information upon a subject upon which we have had no separately published treatise since that of Morgan.* He is not really responsible for the invention of the word in question, but only for its adoption; since so long ago as 1685 a Latin treatise by one John Marius appeared at Augsburg with the title 'Castorologia explicans Castoris animalis naturam et usum medico-chemicum.' This of course related to the European Beaver, and chiefly to the medicinal properties of the so-called "castoreum," which was then held in great esteem as a panacea for all sorts of ailments.

The European and American Beavers were long thought to be specifically identical, until, in 1825, F. Cuvier pointed out the differences which are to be found in the shape and relative length of the nasal bones. Mr. Martin, recognising these as good specific characters, treats of both forms in his book, but naturally devotes the larger share of attention to the Canadian animal, with which he has had better opportunities for becoming acquainted. His account of the European Beaver, in fact, is extremely meagre; and although a chapter is devoted to it, this extends to no more than three pages, and deals very inadequately with the present distribution of the animal in Europe, a subject which was dealt with in much greater detail some few years ago in this Journal (Zool. 1886, pp. 265—286).

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* 'The American Beaver and his Works,' 1868.

The discovery of the Canadian Beaver was, naturally enough, coincident with the discovery of Canada, and the animal proving to be a source of wealth, on account of its valuable skin, its effigy became adopted as a national symbol. But it was not until the establishment of the fur-trading posts at Quebec in 1604, and at Montreal in 1611, that this commercial importance was seriously considered, and the destruction of the Beaver colonies commenced, not only in Canada, but around Hudson's Bay and the shores of Lake Superior, the head waters of the Missouri and the Seskatchewan, and upon the tributaries of the Columbia. The regions bordering on the Yukon, on the upper part of Mackenzie River, on Frazer's River, and on the Sacramento, were also noted for Beavers.

The term "Canadian Beaver" is too restrictive, seeing that there is but this one species in the New World, and that its distribution is uncommonly wide, ranging from the confines of the Arctic Sea on the north, to the Gulf of Mexico, the Rio Grande, and the Gila rivers on the south; and even southward of these ranges, in Tamanlipas in Mexico, which is the southernmost point to which it has been definitely traced. Throughout all the intermediate area, from Hudson's Bay and the Atlantic on the east to the Pacific on the west, it has been found generally distributed.

In his chapters on the life-history of the animal (pp. 45—48) and its engineering accomplishments (pp. 63—77), Mr. Martin does not add much to what was already well known, and on some points still unsettled he gives no information. For example, in the first of these two chapters he does not describe the condition of the young at birth, nor state whether they are born blind or not; and the absence of an index hinders the reader from ascertaining whether this point is touched upon elsewhere.

The attempts which have been made at various times to preserve the Beaver, both in Europe and America, form the subject of another chapter, and the opposite methods adopted in the two continents are thus contrasted (p. 168):—

> "The great difference between the attempts of the white man to perpetuate the beaver and the method adopted by the Indian is all the difference between art and nature. The white man has made artificial enclosures for the beaver; the Indian reserve was a natural beaver district, chosen by the animals as a suitable home and guarded by the Indian from encroachment. Of the regard which beavers had for certain localities Charlevoix says, 'There are some places that the beavers seem to have such an affection for that they do not appear able to leave them, although they are always uneasy there. On the way from Montreal to Lake Huron by the great river, one never fails to find every year at the same place a lodge which these animals build or repair every summer; for the first thing the voyageurs do who arrive there earliest, is to break the lodge and the dam which provides it with water.' The Hudson's Bay Company showed their wisdom by adopting the Indian methods of dealing with nature, and in proportion to the closeness with which they follow these methods so is the measure of their success. They have systematically set aside certain islands along the coast of Hudson's Bay as beaver reserves, those favoured most by the beaver being chosen. We have seen how every third year a family of beaver kittens matures, and the Company considers it wise to visit these islands every third year and carefully gather a crop of beaver pelts, representing the approximate increase based on the known habits of the animals. This triennial hunt is conducted in the most orderly and scientific manner, so as not to disturb the colonies, and those who have accompanied the parties give astonishing accounts of the condition of things witnessed, the beavers having almost completely lost their fear of man, and their works assume the most elaborate proportions. The time will soon come when these reserves will be worked over, and then the limitations will bring about the inevitable result, a sudden disappearance of the busy hosts."

Amongst other subjects discussed, Mr. Martin deals with the mythology and folklore of the Beaver, and its connection with heraldry, but in a fragmentary, scrappy kind of way, too suggestive of paste and scissors. Indeed the volume may be described as a scrap-book of Beaver-lore, wherein the author, in his anxiety to collect all he could find on the subject, has often shown more industry than discrimination.

The poetical effusions which are scattered throughout the book, some of which occupy two or three pages, and the long extracts from Longfellow's 'Hiawatha,' might well have been omitted. We could have dispensed also with various quotations, from Lord Bacon to Miss Arabella Buckley, which are dragged in here and there, and which, having no particular bearing upon the nearest remarks of the author, are printed separately on an opposite page. Divested of this "padding," Mr. Martin's book would be no less useful, and in any new edition a re-arrangement of the chapters would be desirable; for the various subjects dealt with are not arranged in any natural or logical sequence. Mr. Martin commences with Mythology and Folk-lore, and ends with Heraldry. In Chapter V. he deals with the life-history of the animal, and yet defers his remarks on its anatomy and osteology until Chapter XIV., discoursing in the meantime on such topics as "Geographical distribution," "Chemico-medical properties," "Importance in trade," and "Uses in manufactures.'

In an "Appendix" we have some photo-copies from original documents, and an extract of so much as relates to the Beaver in Samuel Hearne's account of his journey from Prince of Wales's Fort, in Hudson's Bay, to the Northern Ocean; undertaken by order of the Hudson's Bay Company in the years 1769—1772.

Wild Spain: Records of Sport with Rifle, Rod and Gun, Natural History and Exploration. By Abel Chapman and Walter J. Buck. With 174 Illustrations, mostly by the Authors. 8vo, pp. 472. London: Gurney and Jackson.

This is not a romantic account of a single visit to Spain. For more than twenty years the authors have undertaken sporting expeditions into various parts of that country, chiefly in Andalusia, but including, at one time or another, nearly all the western provinces from the Mediterranean to Biscay. A love of wild sport has been perhaps the leading motive; but the study of Natural History has hardly been of secondary importance. In pursuit of these objects the authors have spent weeks, sometimes months, at a time in the sierras and wildernesses of Spain, bivouacking wherever night overtook them or the chances of sport might dictate, and camping out on the glorious snow-clad cordilleras.

Their subjects, as they tell us in their Preface, are the wild-life and *feræ naturæ* of the Peninsula, including in the latter expression, by a slight stretch of the term, the brigand and the gipsy, with remarks on agriculture as cognate and supplementary. As far as convenient, the sequence of chapters follows the changes of the season, commencing with spring time. Hence the earlier part of the book is more concerned with Natural History—though the pursuit of Ibex and Bustard may be followed in spring—while the latter half is more exclusively devoted to sport.

Long residence in Spain afforded opportunities which are not available to the ordinary traveller, and this was especially the case with sport, of which at times the authors have enjoyed some of the best that Spain affords. But it should be remarked that many of the shooting campaigns described have been on private and preserved ground; and while they naturally select the more fortunate records, they pass over in silence many a blank day.

It is as well to bear in mind that in Spain nearly all ground on which large game is found is preserved, with the exception of remote parts of the sierras, where Wild-boar and Roe-deer may be shot, and those higher mountain ranges which form the home of Ibex and Chamois. While indicating in general terms the distribution of the various game and other animals, the authors have in many instances prudently abstained from naming precise localities.

From this it will be gathered that the account here given of natural history and sport in Spain is the outcome of considerable experience, and that, so far as it goes, therefore, it is perfectly reliable. More than this, it is of an extremely varied and interesting nature, as a mere glance through the contents is sufficient to show.

After an account of Andalusia and its mountain ranges, we have a description of a boar-hunt in the sierras, and another of some "big-days" with Bustard. These are excellent, as are also the illustrations which accompany them. The history of the "fighting bull" of Spain, that is, of the animal used in the bull-fights, the various breeds, and mode of rearing, will be of interest to those who take an interest in cattle, though they may not see any good reason for upholding the national sport.

Wild Camels in Spain have a chapter to themselves, and although this subject is not new, having been discussed some years ago both in 'The Field,' and incidentally in 'The Ibis,' by Mr. Chapman and others, the opportunity is now taken to review the facts, and to give some explanatory touches to former statements.

Sport and natural history are pleasantly intermingled in the chapters on the Spanish Ibex (pp. 128—166), the Great Bustard (pp. 33—57 and 338—342), and the Little Bustard (pp. 343—347); Deer-driving in the pine forests; Deer-stalking on the southern plains; Wildfowling, and Trout-fishing; while hardly less attractive are the chapters on bird-life as observed at different seasons, including the authors' experience with the great Lammergeier, with Eagles, and with Flamingoes.

From the point of view of the zoologist, perhaps one of the most useful chapters in the volume is that on the large game and smaller mammals of Spain and Portugal, in which an account is given of the present status and distribution in those two countries of the Red-deer, the Fallow-deer, Roebuck, Spanish Ibex, Chamois, Bear, Wild-boar, Wolf, Fox, Spanish Lynx, Wild Cat, Genet, Marten, Polecat, Weasel, and Mongoose. Only one kind of Marten, we are told, is found generally throughout Spain, namely, *M. foina*, which is common in Andalusia, Estremadura, and Valencia, as well as in the Asturias and Santander, but the authors state (p. 448) they have reason to believe that the *marta* of the Pyrenees is the rarer Pine Marten, which, by the way, they name *Mustela abietum*, though *Martes sylvatica*, Nilsson, is its more correct designation; the arboreal species of the Weasel family, genus *Martes*, being properly separable from the terrestrial group to which the genus *Mustela* belongs.

In a book so full of delightful passages, it is extremely difficult to make a selection for quotation, and we shall not attempt it. We prefer rather to recommend the perusal of the entire volume, which is one of the best books on natural history and sport which we have seen for some time.

OBITUARY.

Francis Polkinghorne Pascoe, F.L.S., &c., was born at Penzance on Sept. 1st, 1813, and died at Brighton on June 20th, 1893. He was educated at the Grammar School of his native town, and subsequently entered at St. Bartholomew's Hospital as a student. He was admitted M.R.C.S. in 1835, and soon afterwards obtained an appointment in the Navy as Surgeon, serving on the Australian, West Indian, and Mediterranean stations. In 1843 he married Miss Glasson, of Falmouth, and retired from the service, settling near St. Austell, in the vicinity of which he had a property producing Kaolin (China clay). He was left a widower in 1851, and then settled permanently in London, and devoted his attention entirely to Entomology and Natural History generally. But until lately he travelled much, either alone or in the company of one or more of his daughters, and in this way he traversed nearly over the whole of Europe, North Africa, &c., and once made a voyage to the Lower Amazons to make personal acquaintance with the natural marvels of that rich region. As a writer he commenced with a botanical paper in Henfrey's 'Botanical Gazette,' in 1850, enumerating unrecorded Cornish plants. But he mainly devoted himself to Coleoptera, commencing with the Longicorns, on which he published much, including 'Longicornia Malayana,' enumerating and describing the species collected by Wallace, which formed vol. iii. of the third series of the Trans. Ent. Soc. Lond., 1864—1869, containing 712 pp. with twenty-four coloured plates. Subsequently the Colydiidæ and cognate groups, and still later the Curculionidæ, engaged his attention, and the number of his published papers on Coleoptera is very great. His collections of Coleoptera he sold to the British Museum not long before his death, when ill health warned him that he could make no further use of them; we believe they contained above 2500 type specimens of species described by him. For many years he had also accumulated an enormous mass of materials illustrative of a 'Systema Naturæ.' His active mind was never at rest, and latterly he published many small works on the animal kingdom, the most important being the second edition of his 'Zoological Classification' (1880), in which an enormous amount of information is compressed into a small compass. He joined the Entomological Society of London in 1854, and was President in 1864-65, and there was scarcely any more regular attendant at the meetings; was a member of the Entomological Society of France since 1862; and belonged also to the Belgian, Stettin, and other foreign Societies. He became a Fellow of the Linnean Society in 1852, and was for many years on the Council of the Ray Society and the Scientific Committee of the Royal Horticultural Society. It may be said of him that he was never happy save in the company of naturalists.—*Abridged from the 'Entomologist's Monthly Magazine.'*

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